United States Environmental Protection Agency

CABRILLO PORT LNG TERMINAL

Background on Proposed Cabrillo Port Liquefied Natural Gas Facility

BHP Billiton, International (BHPB) has proposed to construct a new liquefied natural gas (LNG) deepwater port approximately 14 miles offshore of Ventura County, California. The proposed deepwater port, "Cabrillo Port," would consist primarily of a floating storage and re-gasification unit (FSRU) connected to two pipelines laid on the ocean floor. The pipelines would reach land at a station in Oxnard, California. The project is subject to the Deepwater Port Act, and must comply with all applicable environmental laws such as the Clean Air Act (CAA). As a result, BHPB must obtain an air permit from EPA prior to construction.

Air Quality Designation

The proposed location for the FSRU is in Federal waters off the coast of Ventura County, California. The location of the proposed project does not have a formal federal designation. Section 107 of the CAA, and Code of Federal Regulations §81.305 provide for air quality area designations and classifications within the state of California. The applicable air district for Ventura County is the Ventura County Air Pollution Control District (VCAPCD). Two islands (Anacapa and San Nicholas) located off the coast of California are included within the VCAPCD. These islands, which are part of the four northernmost islands of the Channel Islands, are within California state boundaries and are designated as unclassifiable/ attainment under the federal standards. EPA considered factors such as the location of the FSRU in relation to the Channel Islands and the mainland of Ventura County, the current uses of the Channel Islands, and the amount of emissions and the air quality impact to be expected from the stationary source. As a result of this consideration, EPA is proposing to permit Cabrillo Port in the same manner as sources on the Channel Islands which are included within the VCAPCD.

Proposed Cabrillo Port Project Details

Liquefied natural gas is shipped at about -260 degrees Fahrenheit in specially designed double-hull ships (or carriers). For this project, it will be imported to the U.S. from Malaysia, Indonesia and Australia. The carriers would unload the LNG to the FSRU (see Figure 1) for re-gasification. Each LNG carrier berthing, unloading, and de-berthing event would last approximately 20 hours and would occur two to three times per week. Once re-gasified, the natural gas would be transported by the two subsea pipelines to a connecting station near Oxnard. Natural gas would then be distributed through the existing onshore natural gas transmission system owned and operated by Southern California Gas Company.

Figure 1: Floating storage and re-gasification unit

Major Equipment Onboard the FSRU

The proposed design for Cabrillo Port includes three spherical storage tanks with a total capacity of 9,639,000 cubic feet, which would allow the FSRU to re-gasify up to 1.5 billion cubic feet of LNG per day using submerged combustion vaporizers (SCVs). Additional equipment on the FSRU will include eight SCVs, four generator engines (three primary engines and one backup), one diesel fuel storage tank, and other emergency and auxiliary support equipment.

Air Emissions from Cabrillo Port Stationary Units

The annual emissions from the FSRU will be limited to the following:

NOx:	66.05	tons per year (tpy)
ROC:	28.66	tpy
CO:	171.30	tpy
SO_2:	0.42	tpy
PM_{10}:	12.13	tpy

Emission Controls

Emissions from Cabrillo Port are proposed to be controlled through a combination of control devices and operational limitations. The generator engines will be equipped with selective catalytic reduction systems for control of nitrogen oxides, and oxidation catalysts for control of CO and ROC emissions. In addition the SCVs (see Figure 2) will utilize low-NOx burners. The equipment onboard the FSRU will be fueled primarily on natural gas. The support vessels will also be fueled on natural gas rather than more polluting marine bunker fuel, which is conventionally used. Diesel fuel will only be used during limited periods in emergency and fuel-backup situations. All diesel used must meet the stringent California Diesel Fuel Specification with a maximum sulfur content of 15 ppm.

Air Quality Improvement Project

The applicant has committed to air quality mitigation. BHPB has entered into contracts to retrofit two marine vessels (long haul tugs) by replacing two propulsion engines and two auxiliary engines with modern low emitting engines (Tier 2 compliant diesel fired engines). BHPB currently estimates that the repowering of one Sause Brothers tug could result in emission reductions of approximately 123 tons per year of NOx, and the repowering of one Olympic Tug and Barge tug could result in emission reductions of approximately 96 tons per year. However, EPA has not yet completed its own analysis of the emission reductions to be expected from retrofitting these marine vessel engines.

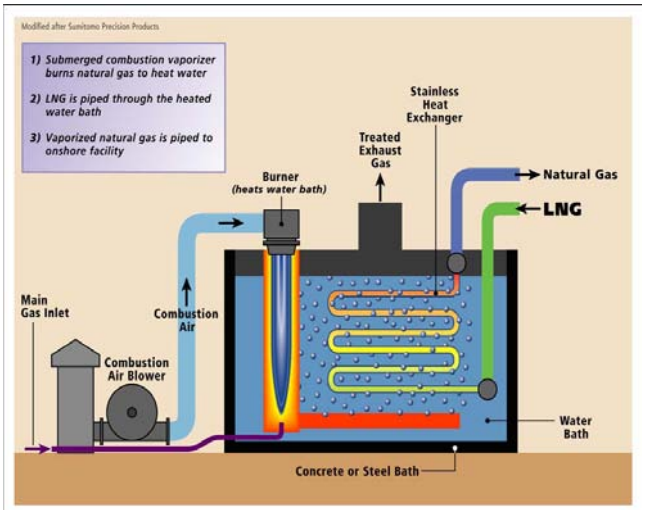

Figure 2: Submerged combustion vaporizer
(Source: Modified after Sumitomo Precision Products)

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EPA R9

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